

**CS 403 – Software Engineering and Data Structures**

**Credit Hours:** 3

**Scheduled hours per week**

Lecture: 3

Lab:

Other:

**Catalog Course Description:** Dealing with problems of programming in the large software life cycle, object-oriented design, numerical algorithms, graph algorithms, pattern matching, and encryption methods.

**Pre-requisites:** CS 221 must be passed with a grade of C or higher

**Co-requisites:**

**Course Learning Outcomes:**

Students should have an understanding of and be able to apply the following concepts:

- Plan a major software project from inception to release and maintenance
- Work from requirement specifications to design a major software project
- Implement a major software project using industry standard tools and techniques
  - Source control repository
  - Unit testing
- Develop test plans
- Present the functionality of a major software project to a technical audience

**Topics to be studied:**

<ul style="list-style-type: none"><li>● Software Processes</li><li>● Agile Software Development</li><li>● Requirements engineering</li><li>● System Modeling</li><li>● Architectural Design</li><li>● Design and Implementation</li><li>● Project Management and Planning</li><li>● Quality Management</li><li>● Configuration Management</li></ul>	<ul style="list-style-type: none"><li>● Testing and Software Evolution</li><li>● Software Reuse</li><li>● Component Based Software Engineering</li><li>● Distributed Software Engineering</li><li>● Service Oriented Software Engineering</li><li>● Systems Engineering</li><li>● Systems of Systems</li></ul>
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**Relationship of Course to Program or Discipline Learning Outcomes:**

BAT-Software Engineering

✓	Ability to understand, plan, and execute good Project Management
✓	Ability to recognize and apply industry recognized code of ethics to various situations
	Ability to understand and apply Information Security concepts and best practices
✓	Ability to understand, plan, and implement good Systems Analysis and Software Engineering
	Ability to understand, plan, implement, and troubleshoot Mobile Applications and related technologies
✓	Ability to understand, plan, implement, and troubleshoot Advanced Web Design and Web Services technologies

For general education courses, a listing of the general education competencies that are met.)

**Relationship of Course to General Education Learning Outcomes:**

<b>Composition and Rhetoric</b> Students illustrate a fundamental understanding of the best practices of communicating in English and meet the writing standards of their college or program-based communication requirements.	✓
<b>Science &amp; Technology</b> Students successfully apply systematic methods of analysis to the natural and physical world, understand scientific knowledge as empirical, and refer to data as a basis for conclusions.	✓
<b>Mathematics &amp; Quantitative Skills</b> Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.	✓
<b>Society, Diversity, &amp; Connections</b> Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.	✓
<b>Human Inquiry &amp; the Past</b> Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills.	
<b>The Arts &amp; Creativity</b> Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.	
<b>5/3/2016</b>	

**Special requirements of the course:**

You will need a computer with an Internet connection

**Additional information:**

**Prepared by:** Gary Thompson

**Date:** 10/20/2017